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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/921,588	08/02/2001	Bradley S. Withers	5646/CMP/CMP/RKK	9496

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APPLIED MATERIALS, INC.
2881 SCOTT BLVD. M/S 2061
SANTA CLARA, CA 95050

EXAMINER

SHAKERI, HADI

ART UNIT	PAPER NUMBER
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3723

DATE MAILED: 06/25/2003

18

Please find below and/or attached an Office communication concerning this application or proceeding.

N.K

Office Action Summary	Application No.	Applicant(s)	
	09/921,588	WITHERS ET AL.	
	Examiner	Art Unit	
	Hadi Shakeri	3723	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on _____.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-27 and 30-39 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-27 and 30-39 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 02 August 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
 If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
 a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ | 6) <input type="checkbox"/> Other: _____ |

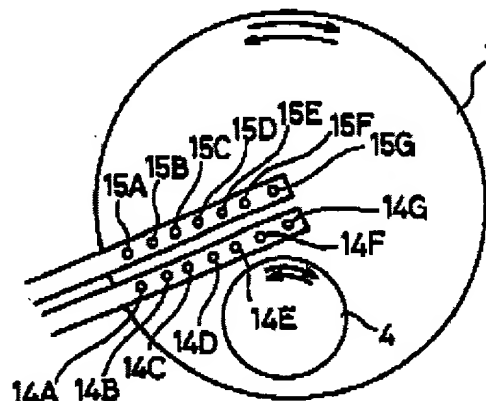
DETAILED ACTION***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-25, 30-33 and 35-39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kimura et al in view of Nagahara et al.

Kimura et al. discloses all the limitations of claims 1, 16, 19, 23, 30 and 31, i.e., a system for delivering a "polishing" fluid to a CMP surface comprising an arm (13), first and at least a second nozzle (10 A...14A...) and although as disclosed in col. 5, line 18, the polishing solutions from all nozzles have the same concentrations, and further as disclosed in the same column lines 53-55, the solution supply nozzles may be equipped with needle valve thus may be considered as "adapted" to deliver the fluid at different rates, e.g., greater volume of polishing fluid on a first region than the polishing fluid on a second region, however, it does not specifically disclose delivering polishing fluid with the same concentration dispensed at different rates at different regions. Nagahara et al. teaches an apparatus and method for polishing a substrate at radially varying polishing rates by delivering the fluid at dissimilar flow rates (Abstract).



It would have been obvious to one of ordinary skill in the art, at the time the invention was made, to modify the system of Kimura et al. by delivering polishing fluids having the same concentration at varying rates to different regions as taught by Nagahara et al. to adapt the

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system for removing film material at dissimilar rates to offset films which have previously accumulated at dissimilar thicknesses across the wafer, (Nagahara et al. col. 2, lines 8-16).

Regarding claims, 2-5, 7-9, 15, 17, 18, 20-22, 24, 25, 32, 33, 35, 36 and 39, PA (Kimura et al. as modified by Nagahara et al.) meets the limitations, e.g., a flow control device coupled to each of the nozzles, (Kimura et al., col. 5, lines 20-25); measurement of wafer, (Kimura et al., col. 4, lines 50-59).

Regarding claims, 6, PA (Kimura et al. col. 6, lines 5-7 and 30-35) meets the limitations,.

Regarding claims 10 and 11, PA (Nagahara et al., e.g., col. 4, line 26 and col. 7, lines 27) teaches that the system may utilize either a polyurethane pad or abrasive pad.

Regarding claims 12-14, 37 and 38, Kimura in view of Nagahara meets all the limitations except for disclosing the specific flow rates. It would have been obvious to one having ordinary skill in the art at the time the invention was made to use the specified flow rate, e.g., first flow rate of within a range of 1.2 to 20 times greater than the second flow rate, depending on the measured properties and desired end results, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

3. Claims 26 and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kimura et al. in view of Nagahara et al as applied to claim 23 above, further in view of Winebarger, US Patent No. 5,433,650.

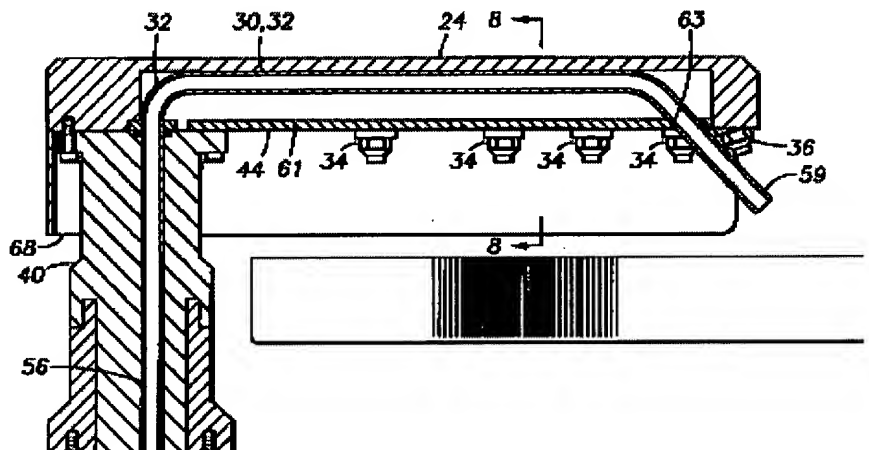
Kimura et al. as modified by Nagahara et al. meets all the limitations of claims 26 and 27 except for disclosing adjusting the flow rate during the polishing in response to a polishing metric. Winebarger teaches a method for polishing a substrate in which the polishing parameters are adjusted during the polishing based on monitored values. It is known in the art, as shown by Winebarger, to adjust the polishing parameters during the operation, it would have

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been obvious to one of ordinary skill in the art at the time the invention was made to further modify the modified invention of Kimura in view of Nagahara, by providing means for in-situ monitoring and adjustment in view of Winebarger, to enhance the polishing operation.

4. Claim 34 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kimura et al. in view of Nagahara et al as applied to claim 31 above, further in view of Kennedy et al, US Patent No. 6,139,406.

Kimura et al. as modified by Nagahara et al. meets all the limitations of claim 34, except for disclosing for the delivery lines to be disposed within the arm. Kennedy et al. teaches a combined slurry and rinse arm in which the delivery lines (30) (32) are disposed within the arm. It is known in the art, as shown by Kennedy et al., to deliver polishing fluid with lines dispensed in the arm, it would have been obvious to one of ordinary skill in



the art at the time the invention was made to further modify the modified invention of Kimura and Nagahara, by providing polishing lines dispensed within the arm as an economical and efficient means of delivering the polishing fluid.

Response to Arguments

5. Applicant's arguments filed 04/23/03 have been fully considered but they are not persuasive. The rejections over Chiou is withdrawn in view of Applicant's declaration under 37 C.F.R. § 1.131, however it is noted that Chiou was submitted by the Applicant in the second IDS, paper number 04 filed on 08/12/02.

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In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, Kimura specifically teaches improving the flatness across the entire surface of a wafer by properly adjusting "polishing operations" along the radial direction on the polishing cloth to achieve a uniform pattern of material removal suitable to a particular set of polishing conditions, col. 6, lines 13-18. Further it teaches lowering the concentration in an area where the removal rate is high while the concentration of the polishing solution can be raised in an area where the removal rate is low, thus providing an optimum distribution of concentrations of the polishing solution along a radial direction, by mixing polishing solutions containing abrasives with a diluting liquid to produce a specific concentration of polishing solution, however as one of ordinary skill in the art would implicitly realized is that one may change the "concentration" of abrasive solution delivered to the workpiece surface by controlling the amount, i.e., adjusting the volume or rate of delivery of the polishing solution to deliver higher amount in the areas of low removal rates. But, never the less, Nagahara is applied since it explicitly teaches delivering the fluid at dissimilar flow rates and pressure across a wafer. Nagahara achieves this in the embodiment disclosed through the pad, however the primary teaching of uniform pattern of material removal by properly adjusting the flow rate along the radial direction and not the apparatus as disclosed combined with Kimura meets all the limitations of the claimed invention, thus applicant's arguments against the references individually, would amount to piecemeal analysis.

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Conclusion

6. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

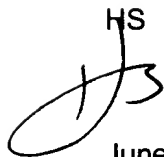
A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

7. Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Hadi Shakeri at (703) 308-6279, FAX (703) 746-3279 for unofficial documents. The examiner can normally be reached on Monday-Thursday, 7:30 AM to 6:00 PM. Official documents may be faxed to (703) 872-9302, after final to (703) 872-9303.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist at (703) 308-1148.



Joseph J. Hail, III
Supervisory Patent Examiner
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June 20, 2003